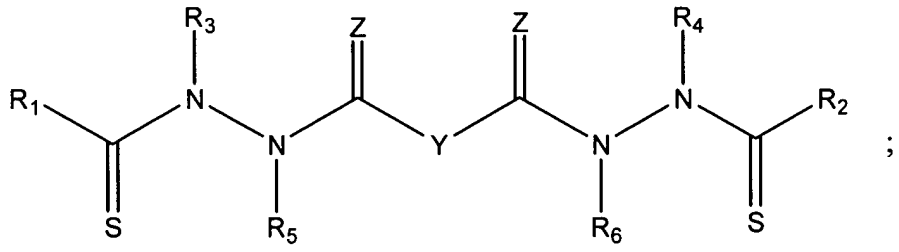
CLAIMS

What is claimed is:

1. A method of treating a subject with a multi-drug resistant cancer, said method comprising administering to the subject an effective amount of a compound represented by the following structural formula:



;

or a pharmaceutically acceptable salt thereof, wherein:

Y is a covalent bond or a substituted or unsubstituted straight chained hydrocarbyl group, or, Y, taken together with both >C=Z groups to which it is bonded, is a substituted or unsubstituted aromatic group;

R_1-R_4 are independently -H, an aliphatic group, a substituted aliphatic group, an aryl group or a substituted aryl group, or R_1 and R_3 taken together with the carbon and nitrogen atoms to which they are bonded, and/or R_2 and R_4 taken together with the carbon and nitrogen atoms to which they are bonded, form a non-aromatic heterocyclic ring optionally fused to an aromatic ring;

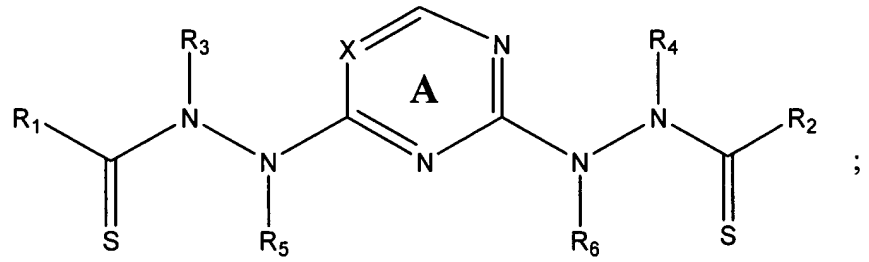
R_5-R_6 are independently -H, an aliphatic group, a substituted aliphatic group, an aryl group or a substituted aryl group; and

Z is =O or =S.

2. The method of Claim 1 wherein R_1 and R_2 are the same and R_3 and R_4 are the same.

3. The method of Claim 2 wherein Y, taken together with both >C=Z groups to which it is bonded, is a substituted or unsubstituted arylene group.

4. The method of Claim 3 wherein the compound is represented by the following structural formula:



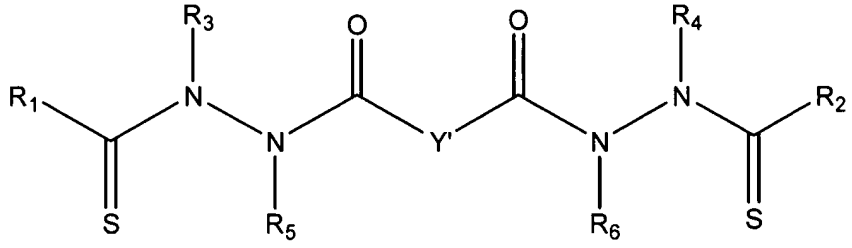
;

wherein Ring **A** is substituted or unsubstituted and X is -CH- or -N-.

5. The method of Claim 2 wherein Y is a covalent bond, a substituted or unsubstituted straight chained hydrocarbyl group or a phenylene group.

6. The method of Claim 5 wherein Y is a covalent bond, $-C(R_7R_8)-$, $-(CH_2CH_2)-$, *trans*-(CH=CH)-, *cis*-(CH=CH)-, -(CC)- or a 1,4-phenylene group.

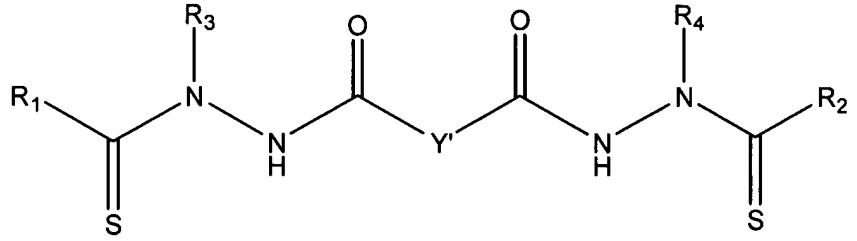
7. The method of Claim 2 wherein the compound is represented by the following structural formula:



;

wherein Y' is a covalent bond or -C(R_7R_8)- and R_7 and R_8 are each independently -H, an aliphatic or substituted aliphatic group, or R_7 is -H and R_8 is a substituted or unsubstituted aliphatic group or substituted or unsubstituted aryl group, or, R_7 and R_8, taken together, are a C2-C6 substituted or unsubstituted alkylene group.

8. A method of treating a subject with a multi-drug resistant cancer, said method comprising administering to the subject an effective amount of a compound represented by the following structural formula:



;

or a pharmaceutically acceptable salt thereof, wherein:

Y' is a covalent bond or -C(R_7R_8)-;

R_1 and R_2 are each a substituted or unsubstituted aryl group;

R_3 and R_4 are each a substituted or unsubstituted aliphatic group;

R_7 is -H; and

R_8 is -H, an aliphatic or substituted aliphatic group.

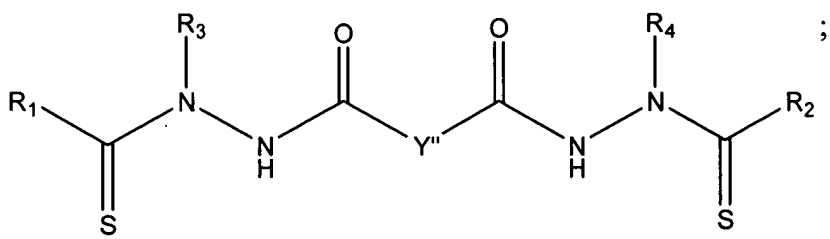
9. The method of Claim 8 wherein R_1 and R_2 are the same and R_3 and R_4 are the same.

10. The method of Claim 9 wherein R_3 and R_4 are each an alkyl group and R_8 is -H or methyl.

11. The method of Claim 10 wherein R_1 and R_2 are each a substituted or unsubstituted phenyl group and R_3 and R_4 are each methyl or ethyl.

12. The method of Claim 11 wherein the phenyl group represented by R_1 and the phenyl group represented by R_2 are optionally substituted with one or more groups selected from -OH, -Br, -Cl, -I, -F, -OR^a, -O-COR^a, -COR^a, -CN, -NO_2, -COOH, -SO_3H, -NH_2, -NHR^a, -$N(R^aR^b)$, -$COOR^a$, -CHO, -$CONH_2$, -$CONHR^a$, -$CON(R^aR^b)$, -$NHCOR^a$, -$NRCOR^a$, -$NHCONH_2$, -$NHCONR^aH$, -$NHCON(R^aR^b)$, -NR^cCONH_2, -NR^cCONR^aH, -$NR^cCON(R^aR^b)$, -C(=NH)-NH_2, -C(=NH)-NHR^a, -C(=NH)-$N(R^aR^b)$, -$C(=NR^c)$-NH_2, -$C(=NR^c)$-NHR^a, -$C(=NR^c)$-$N(R^aR^b)$, -NH-C(=NH)-NH_2, -NH-C(=NH)-NHR^a, -NH-C(=NH)-$N(R^aR^b)$, -NH-$C(=NR^c)$-NH_2, -NH-$C(=NR^c)$-NHR^a, -NH-$C(=NR^c)$-$N(R^aR^b)$, -NR^dH-C(=NH)-NH_2, -NR^d-C(=NH)-NHR^a, -NR^d-C(=NH)-$N(R^aR^b)$, -NR^d-$C(=NR^c)$-NH_2, -NR^d-$C(=NR^c)$-NHR^a, -NR^d-$C(=NR^c)$-$N(R^aR^b)$, -$NHNH_2$, -$NHNHR^a$, -NHR^aR^b, -SO_2NH_2, -SO_2NHR^a, -$SO_2NR^aR^b$, -CH=CHR^a, -CH=CR^aR^b, -CR^c=CR^aR^b,-CR^c=CHR^a, -CR^c=CR^aR^b, -CCR^a, -SH, -SR^a, -S(O)R^a, -$S(O)_2R^a$, a non-aromatic heterocyclic group, a substituted non-aromatic heterocyclic group, a benzyl group, a substituted benzyl group, an aryl group or substituted aryl group, wherein R^a-R^d are each independently an alkyl group, substituted alkyl group, benzyl, substituted benzyl, aromatic or substituted aromatic group, or, -$N(R^aR^b)$, taken together, form a substituted or unsubstituted non-aromatic heterocyclic group.

13. The method of Claim 1 wherein the compound is represented by the following structural formula:



;

wherein

Y" is a covalent bond or $-CH_2-$; and

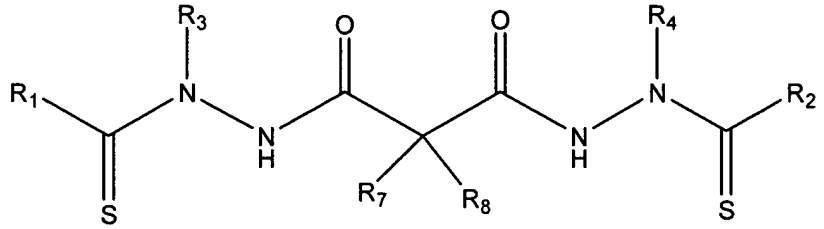
R_1 and R_2 are both a substituted or unsubstituted aliphatic group.

14. The method of Claim 13 wherein R_1 and R_2 are both C3-C8 cycloalkyl group optionally substituted with at least one alkyl group.

15. The method of Claim 14 wherein R_3 and R_4 are both a substituted or unsubstituted alkyl group.

16. The method of Claim 15 wherein R_1 and R_2 are both cyclopropyl or 1-methylcyclopropyl.

17. A method of treating a subject with a multi-drug resistant cancer, said method comprising administering to the subject an effective amount of a compound represented by the following structural formula:



;

or a pharmaceutically acceptable salt thereof, wherein:

R_1 and R_2 are both phenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both phenyl; R_3 and R_4 are both ethyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 4-cyanophenyl; R_3 and R_4 are both methyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both 4-methoxyphenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both phenyl; R_3 and R_4 are both methyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both phenyl; R_3 and R_4 are both ethyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both 4-cyanophenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2,5-dimethoxyphenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2,5-dimethoxyphenyl; R_3 and R_4 are both methyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both 3-cyanophenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 3-fluorophenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 4-chlorophenyl; R_3 and R_4 are both methyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both 2-dimethoxyphenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 3-methoxyphenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2,3-dimethoxyphenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2,3-dimethoxyphenyl; R_3 and R_4 are both methyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both 2,5-difluorophenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2,5-difluorophenyl; R_3 and R_4 are both methyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both 2,5-dichlorophenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2,5-dimethylphenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2,5-dimethoxyphenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both phenyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2,5-dimethoxyphenyl; R_3 and R_4 are both methyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both cyclopropyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both cyclopropyl; R_3 and R_4 are both ethyl; R_7 and R_8 are both -H;

R_1 and R_2 are both cyclopropyl; R_3 and R_4 are both methyl; R_7 is methyl; R_8 is -H;

R_1 and R_2 are both 1-methylcyclopropyl; R_3 and R_4 are both methyl; Y' is bond;

R_1 and R_2 are both 1-methylcyclopropyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 1-methylcyclopropyl; R_3 and R_4 are both methyl; R_7 is methyl and R_8 is -H;

R_1 and R_2 are both 1-methylcyclopropyl; R_3 and R_4 are both methyl; R_7 is ethyl and R_8 is -H;

R_1 and R_2 are both 1-methylcyclopropyl; R_3 and R_4 are both methyl; R_7 is *n*-propyl and R_8 is -H;

R_1 and R_2 are both 1-methylcyclopropyl; R_3 and R_4 are both methyl; R_7 and R_8 are both methyl;

R_1 and R_2 are both 1-methylcyclopropyl; R_3 and R_4 are both ethyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 1-methylcyclopropyl; R_3 is methyl, and R_4 is ethyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2-methylcyclopropyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 2-phenylcyclopropyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both 1-phenylcyclopropyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both cyclobutyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both cyclopentyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both cyclohexyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both cyclohexyl; R_3 and R_4 are both phenyl; R_7 and R_8 are both -H;

R_1 and R_2 are both methyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are both methyl; R_3 and R_4 are both *t*-butyl; R_7 and R_8 are both -H;

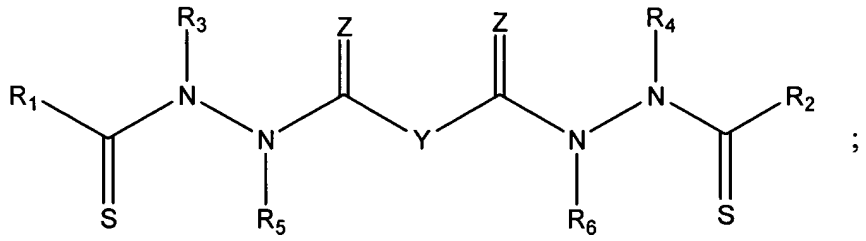
R_1 and R_2 are both methyl; R_3 and R_4 are both phenyl; R_7 and R_8 are both -H;

R_1 and R_2 are both *t*-butyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H;

R_1 and R_2 are ethyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H; or

R_1 and R_2 are both *n*-propyl; R_3 and R_4 are both methyl; R_7 and R_8 are both -H.

18. A method of treating a subject other than a mouse with cancer, said method comprising administering to the subject an effective amount of a compound represented by the following structural formula:



;

or a pharmaceutically acceptable salt thereof, wherein:

Y is a covalent bond or a substituted or unsubstituted straight chained hydrocarbyl group, or, Y, taken together with both >C=Z groups to which it is bonded, is a substituted or unsubstituted aromatic group;

R_1-R_4 are independently -H, an aliphatic group, a substituted aliphatic group, an aryl group or a substituted aryl group, or R_1 and R_3 taken together with the carbon and nitrogen atoms to which they are bonded, and/or R_2 and R_4 taken together with the carbon and nitrogen atoms to which they are bonded, form a non-aromatic heterocyclic ring optionally fused to an aromatic ring;

R_5-R_6 are independently -H, an aliphatic group, a substituted aliphatic group, an aryl group or a substituted aryl group; and

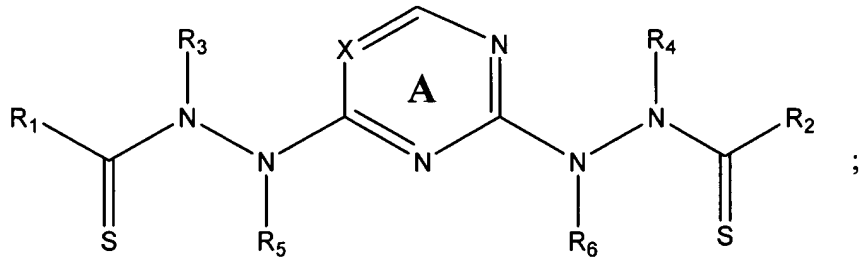
Z is =O or =S;

wherein the subject is optionally co-administered a second anti-cancer agent other than taxol or an analog of taxol.

19. The method of Claim 18 wherein R_1 and R_2 are the same and R_3 and R_4 are the same.

20. The method of Claim 19 wherein Y, taken together with both >C=Z groups to which it is bonded, is a substituted or unsubstituted arylene group.

21. The method of Claim 20 wherein the compound is represented by the following structural formula:



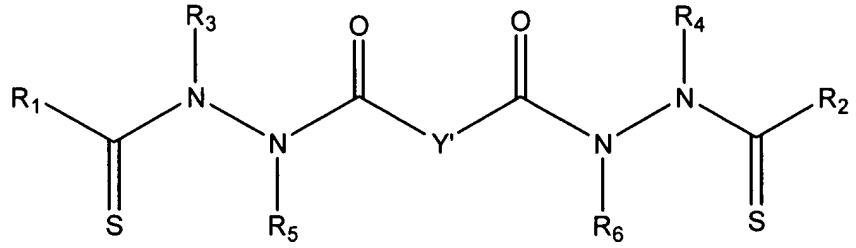
;

wherein Ring **A** is substituted or unsubstituted and X is -CH- or -N-.

22. The method of Claim 19 wherein Y is a covalent bond, a substituted or unsubstituted straight chained hydrocarbyl group or a phenylene group.

23. The method of Claim 22 wherein Y is a covalent bond, $-(CH_2CH_2)-$, *trans*-(CH=CH)-, *cis*-(CH=CH)-, -(CC)- or a 1,4-phenylene group.

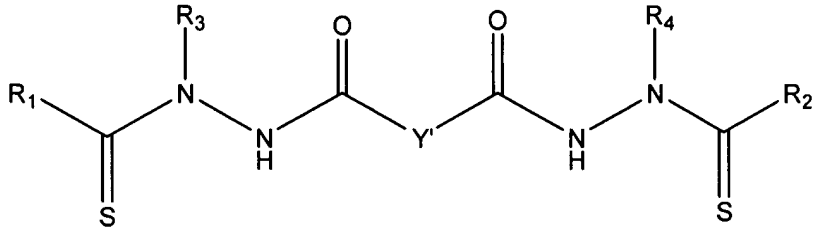
24. The method of Claim 19 wherein the compound is represented by the following structural formula:



;

wherein Y' is a covalent bond or -C(R_7R_8)- and R_7 and R_8 are each independently -H, an aliphatic or substituted aliphatic group, or R_7 is -H and R_8 is a substituted or unsubstituted aryl group, or, R_7 and R_8, taken together, are a C2-C6 substituted or unsubstituted alkylene group.

25. The method of Claim 24 wherein the compound is represented by the following structural formula:



;

Y' is a covalent bond or -C(R_7R_8)-;

R_1 and R_2 are each a substituted or unsubstituted aryl group;

R_3 and R_4 are each a substituted or unsubstituted aliphatic group;

R_7 is -H; and

R_8 is -H, an aliphatic or substituted aliphatic group.

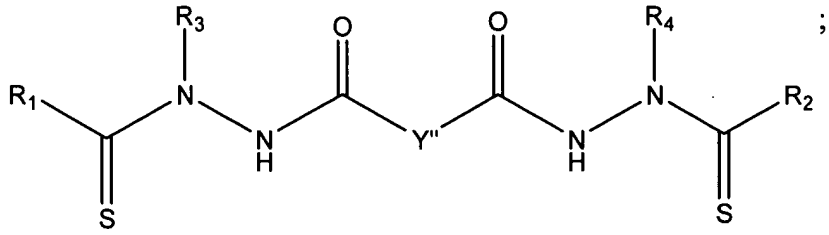
26. The method of Claim 25 wherein R_1 and R_2 are the same and R_3 and R_4 are the same.

27. The method of Claim 26 wherein R_3 and R_4 are each an alkyl group and R_8 is -H or methyl.

28. The method of Claim 27 wherein R_1 and R_2 are each a substituted or unsubstituted phenyl group and R_3 and R_4 are each methyl or ethyl.

29. The method of Claim 28 wherein the phenyl group represented by R_1 and the phenyl group represented by R_2 are optionally substituted with one or more groups selected from -OH, -Br, -Cl, -I, -F, $-OR^a$, $-O-COR^a$, $-COR^a$, -CN, $-NO_2$, -COOH, $-SO_3H$, $-NH_2$, $-NHR^a$, $-N(R^aR^b)$, $-COOR^a$, -CHO, $-CONH_2$, $-CONHR^a$, $-CON(R^aR^b)$, $-NHCOR^a$, $-NRCOR^a$, $-NHCONH_2$, $-NHCONR^aH$, $-NHCON(R^aR^b)$, $-NR^cCONH_2$, $-NR^cCONR^aH$, $-NR^cCON(R^aR^b)$, $-C(=NH)-NH_2$, $-C(=NH)-NHR^a$, $-C(=NH)-N(R^aR^b)$, $-C(=NR^c)-NH_2$, $-C(=NR^c)-NHR^a$, $-C(=NR^c)-N(R^aR^b)$, $-NH-C(=NH)-NH_2$, $-NH-C(=NH)-NHR^a$, $-NH-C(=NH)-N(R^aR^b)$, $-NH-C(=NR^c)-NH_2$, $-NH-C(=NR^c)-NHR^a$, $-NH-C(=NR^c)-N(R^aR^b)$, $-NR^dH-C(=NH)-NH_2$, $-NR^d-C(=NH)-NHR^a$, $-NR^d-C(=NH)-N(R^aR^b)$, $-NR^d-C(=NR^c)-NH_2$, $-NR^d-C(=NR^c)-NHR^a$, $-NR^d-C(=NR^c)-N(R^aR^b)$, $-NHNH_2$, $-NHNHR^a$, $-NHR^aR^b$, $-SO_2NH_2$, $-SO_2NHR^a$, $-SO_2NR^aR^b$, $-CH=CHR^a$, $-CH=CR^aR^b$, $-CR^c=CR^aR^b$,$-CR^c=CHR^a$, $-CR^c=CR^aR^b$, $-CCR^a$, -SH, $-SR^a$, $-S(O)R^a$, $-S(O)_2R^a$, a non-aromatic heterocyclic group, a substituted non-aromatic heterocyclic group, a benzyl group, a substituted benzyl group, an aryl group or substituted aryl group, wherein R^a-R^d are each independently an alkyl group, substituted alkyl group, benzyl, substituted benzyl, aromatic or substituted aromatic group, or, $-N(R^aR^b)$, taken together, form a substituted or unsubstituted non-aromatic heterocyclic group.

30. The method of Claim 14 wherein the compound is represented by the following structural formula:



;

wherein

Y" is a covalent bond or $-CH_2-$; and

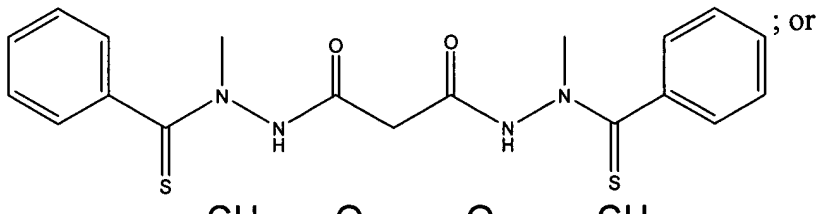
R_1 and R_2 are both a substituted or unsubstituted aliphatic group.

31. The method of Claim 30 wherein R_1 and R_2 are both C3-C8 cycloalkyl group optionally substituted with at least one alkyl group.

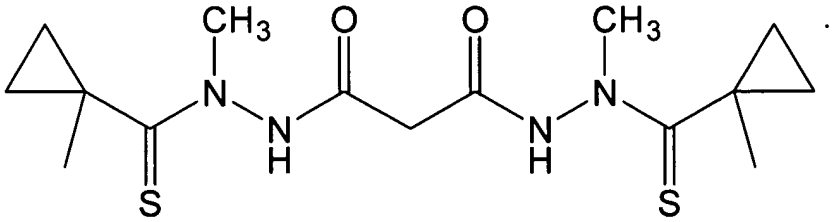
32. The method of Claim 31 wherein R_3 and R_4 are both a substituted or unsubstituted alkyl group.

33. The method of Claim 32 wherein R_1 and R_2 are both cyclopropyl or 1-methylcyclopropyl.

34. The method of Claim 1, wherein the compound is:



; or



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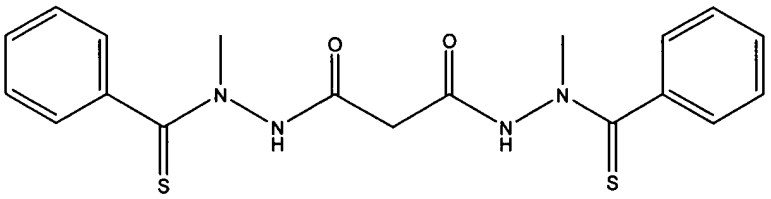
35. The method of Claim 18, wherein the compound is:



; or